

N91-21363

Workshop on Containerless Experimentation in Microgravity

High-Temperature Metal Purification Using a Compact, Portable rf Heating and Levitation System on the Wake Shield

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This paper describes the potential use of a compact, battery-operated rf levitator and heating system to purify high-temperature melting materials in space. The wake shield now being fabricated for the Space Vacuum Epitaxy Center at the university of Texas will provide an Ultra-high vacuum (10^{-14} Torr hydrogen, 10^{-14} Torr helium, 10^{-30} Torr oxygen,...). This paper illustrates the use of the wake shield to purify niobium, titanium, tungsten, iridium, and other metals to a purity level not achievable on earth.

* Operator by Martin Marietta Energy Systems, Inc. for the U.S. Department of Energy under Contract No. DE-AC05-84OR21400.

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**HIGH TEMPERATURE METAL PURIFICATION
USING A COMPACT PORTABLE RF HEATING AND
LEVITATION SYSTEM ON THE WAKE SHIELD**

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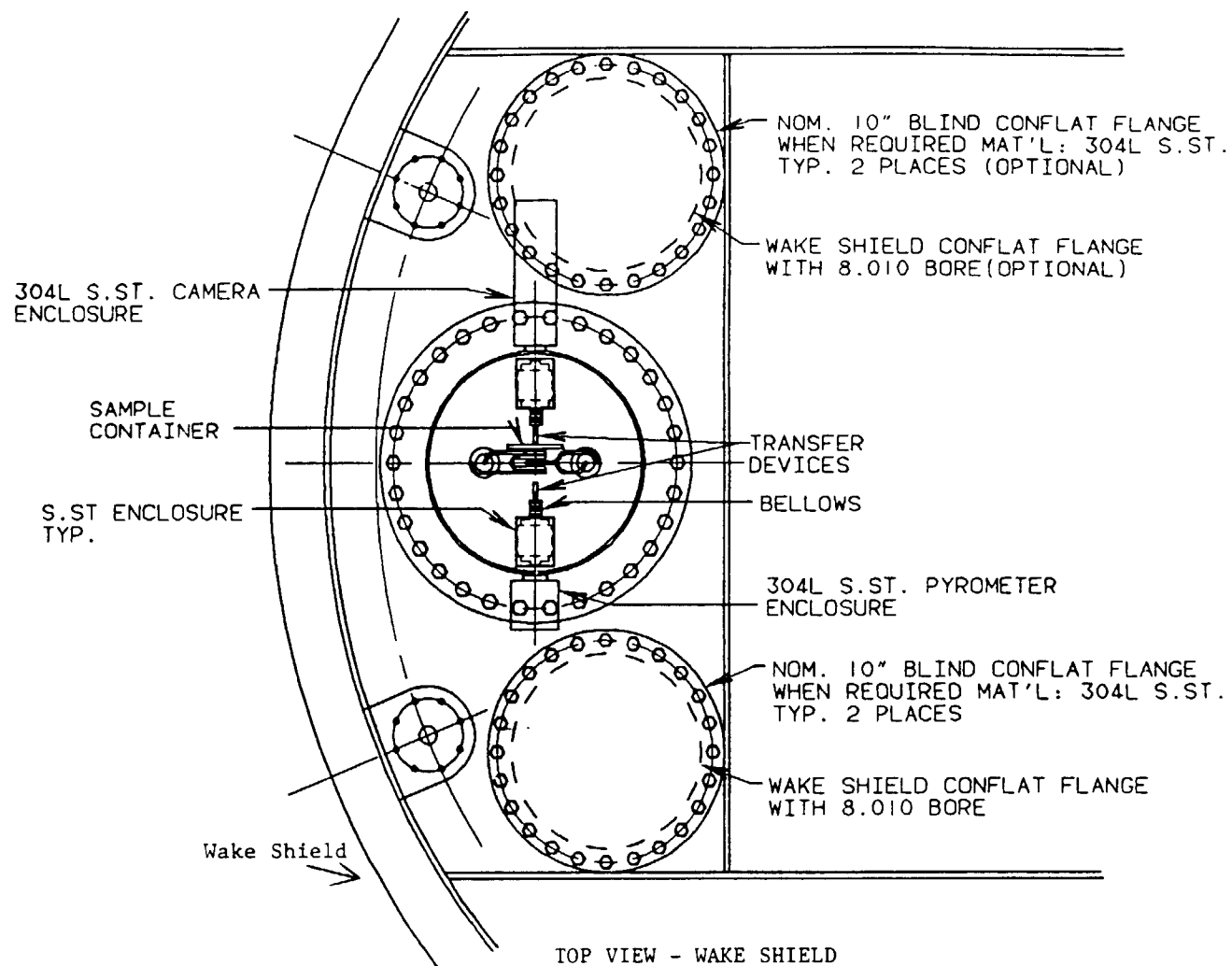
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**HIGH TEMPERATURE METAL PURIFICATION
EXPERIMENTS USING A COMPACT PORTABLE
RF HEATING AND LEVITATION SYSTEM ON
THE WAKE SHIELD**

- | | |
|-------------------------------|--------------------------------------|
| • Vacuum | 10^{-14} Torr |
| • Sample Heating & Levitation | Liquid-Cooled rf Coils |
| • Operating Temperature Range | 650 - 2600° C |
| • Battery Power | 1500 W |
| • Process Control | 3-point Contact (of sample material) |
| • Number of Samples | 60 |
| • Sample Stability | > 1 rpm |
| • Sample Access | Via Coil Ends |
| • Video Camera | Sample Detail
General Viewing |

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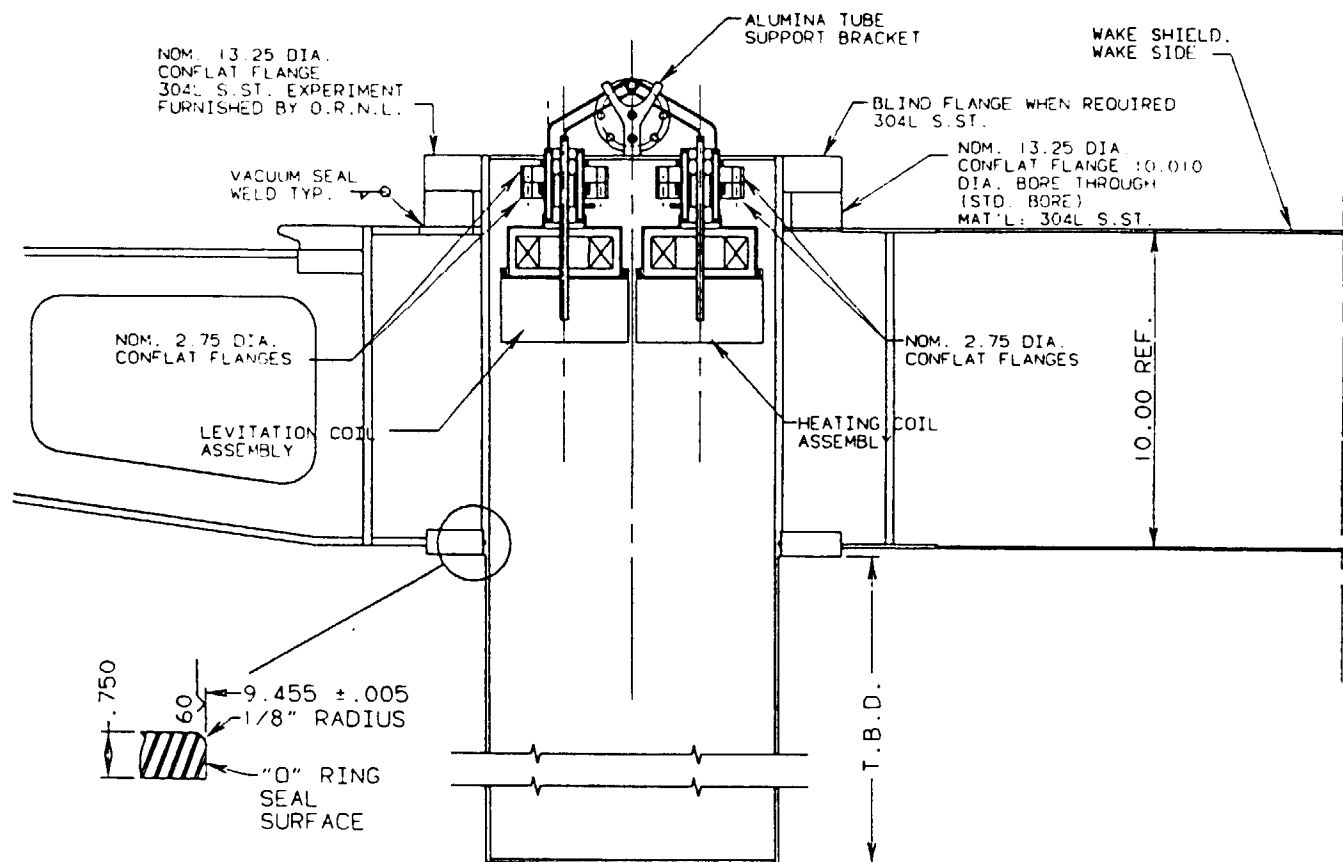


Figure 2 Typical Section

TYPICAL SECTION - WAKE SHIELD

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